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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------|-------------|----------------------|---------------------|------------------|
| 10/576,229 | 04/13/2006 | Jong-Won Kim | SUN-0151 | 7019 |
| 23413 | 7590 | 09/05/2007 | EXAMINER | |
| CANTOR COLBURN, LLP | | | ARTMAN, THOMAS R | |
| 55 GRIFFIN ROAD SOUTH | | | ART UNIT | PAPER NUMBER |
| BLOOMFIELD, CT 06002 | | | 2882 | |
| MAIL DATE | | DELIVERY MODE | | |
| 09/05/2007 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/576,229 | KIM ET AL. | |
| | Examiner | Art Unit | |
| | Thomas R. Artman | 2882 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 April 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-4 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 April 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>4/13/2006</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on April 13th, 2006, is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. Please see the attached PTO-1449 (2 pages).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amtower (US 6,272,204 B1) in view of Zweig (US 5,590,170).

Regarding claims 1 and 3, Amtower discloses an inspection system (Figs. 1, 3 and 4), including:

- a) a transfer unit 115 that lands an inspected object 110 safely thereon and transfers the inspected object to a predetermined position,
- b) an x-ray generating unit 125 that is installed below the transfer unit and emits x-rays having a predetermined wavelength to the inspected object,

c) an optical unit 140 that optically illuminates the inspected object to create a visual image, and

d) a camera 145 that receives an x-ray image.

Amtower does not specifically disclose that the camera has a light amplifying unit.

Zweig teaches the known practice of using a light amplifying unit (Fig.2) in order to convert and amplify the x-ray radiation to optical light, thus improving detection efficiency.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Amtower to use a light amplifying unit as taught by Zweig in order to improve detection efficiency as is known in the art.

With respect to claim 4, neither Amtower nor Zweig specifically discloses that the camera is a CCD sensor.

However, it is well-known in the art for CCD sensors to be used in x-ray image acquisition, where the x-ray radiation is converted and amplified by an image intensifier or scintillation screen to optical light, and Amtower teaches that CCD arrays are known for imaging optical light (col.1, lines 27-33).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Amtower to use a CCD array in the camera 145 since it is well known to use CCD sensors, which are cost-effective and quite common, for imaging the optical light from converted and amplified x-rays.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Navab (US 7,198,404 B2) in view of Zweig.

Regarding claims 1 and 3, Navab discloses an inspection system (Fig.5), including:

- a) a transfer unit (object 530 table, not shown) that lands an inspected object 530 safely thereon and transfers the inspected object to a predetermined position,
- b) an x-ray generating unit 650 that is installed below the transfer unit and emits x-rays having a predetermined wavelength to the inspected object,
- c) an optical unit 510 and 542 that optically illuminates the inspected object to create a visual image, and
- d) a camera 570 that receives an x-ray image.

Navab does not specifically disclose that the camera has a light amplifying unit.

Zweig teaches the known practice of using a light amplifying unit (Fig.2) in order to convert and amplify the x-ray radiation to optical light, thus improving detection efficiency.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Navab to use a light amplifying unit as taught by Zweig in order to improve detection efficiency as is known in the art.

With respect to claim 2, Navab further teaches:

- e) the light amplifying unit and the x-ray generating unit 550 are placed vertically below the camera 570 (Navab, as modified by Zweig, would have the light amplifying unit as part of the camera),
- f) the optical unit placed laterally side by side with the light amplifying unit (Fig.5),
- g) the light axis between the x-ray generating unit and the camera has a half-mirror 562 arranged with a predetermined angle, and
- h) the emitting light axis of the optical unit 542, a reflection mirror 524 is arranged in a position being on the same line in a horizontal direction where the half-mirror 562 is placed (Fig.5).

With respect to claim 4, neither Navab nor Zweig specifically discloses that the camera is a CCD sensor.

However, it is well-known in the art for CCD sensors to be used in x-ray image acquisition, where the x-ray radiation is converted and amplified by an image intensifier or scintillation screen to optical light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Navab to use a CCD array in the camera 570 since it is well known to use CCD sensors, which are cost-effective and quite common, for imaging the optical light from converted and amplified x-rays.

Conclusion

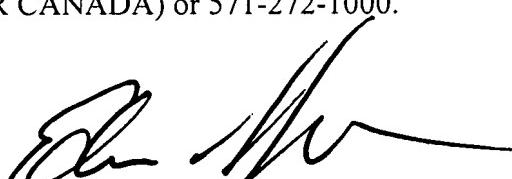
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ogura (US 6,731,718 B2) teaches the practice of using a single detector assembly for both optical and x-ray imaging.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Artman whose telephone number is (571) 272-2485. The examiner can normally be reached on 9am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thomas R. Artman
Patent Examiner



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER